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From Buffer to Catalysts: When Financial Institutions Unlock the Long-Run Poverty-Reducing Power of Remittances

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Abstract: Remittances, the money migrant workers send to their origin country, are now a dominant external finance source for many developing countries, often surpassing official aid and foreign direct investment inflows. While widely recognized for supporting household consumption, their role in long-term poverty reduction remains contested. This study explores whether remittances only become developmentally effective under specific financial institutional conditions. Grounded in theories of absorptive capacity and institutional complementarity, it applies a dynamic panel threshold model to test whether financial system depth conditions the poverty-reducing impact of remittance inflows. Using panel data from 96 developing countries covering the period 2002 to 2021, the analysis identifies distinct regimes of remittance effectiveness. The findings offer a structural explanation for cross-country differences in remittance outcomes and provide new insight into how financial maturity shapes the developmental role of migrant transfers. Implications are drawn for SDGs related to poverty, financial access, and remittance cost reduction.

Keywords: remittances, poverty, financial development, institutional threshold, SDGs, panel data

1. Introduction

In 2024, the World Bank reported that global remittance flows to low- and middle-income countries (LMICs) reached $685 billion, exceeding both foreign direct investment (FDI) and official development assistance (ODA). Remittances are often portrayed as stabilizing forces for household welfare, particularly in contexts marked by institutional fragility and limited state capacity.

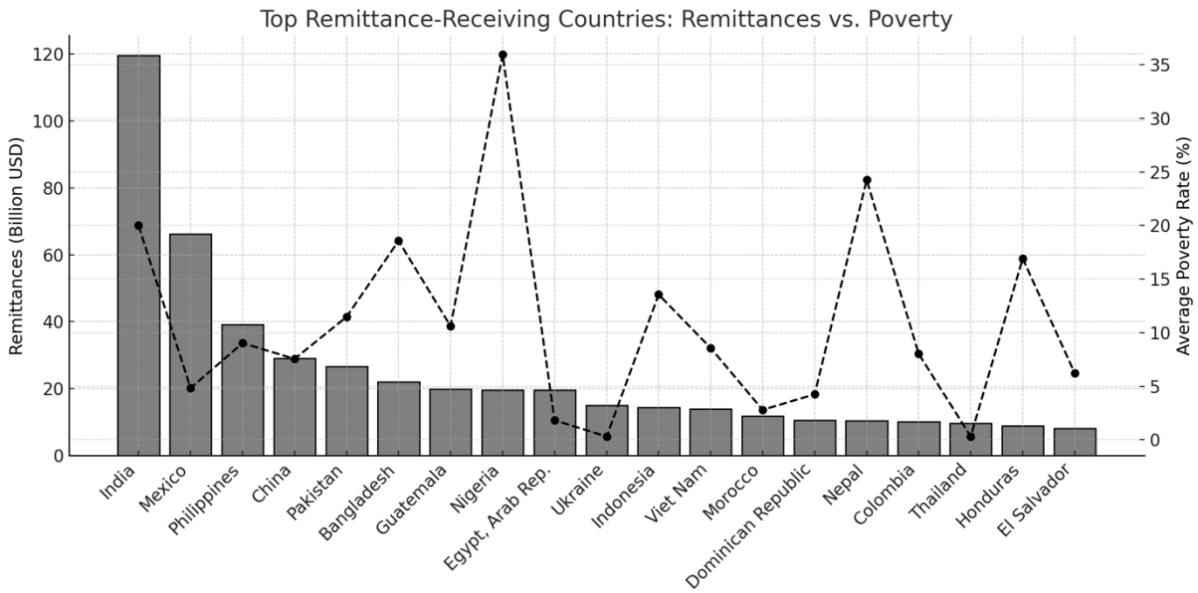

Figure 1. Average Poverty Rates and Remittance Inflows (% Of Gdp) by Countries

Source: Author's Calculation from World Bank, WDI

However, the developmental potential of remittances remains ambiguous. While they buffer consumption in times of crisis, their long-run effect on poverty is inconsistent across countries with similar inflow levels. Figure 1.1 illustrates this divergence: despite similar remittance to GDP ratios indicated by the bar graph, poverty outcomes in scatterplot differ markedly across countries, implying that remittances interact with other country-specific characteristics. This puzzle suggests that remittances are not inherently poverty-reducing and that their effectiveness may depend on structural conditions, primarily the quality and depth of a country's financial institutions.

This study explores whether financial institutional development, measured as domestic credit to the private sector by banks (% of GDP), is a necessary precondition for remittances to transform from short-term stabilizers into long-term poverty-reduction catalysts. Using a panel of 96 developing countries, the study tests the following questions: (1) Is there a threshold level of financial institutional development beyond which the poverty-reducing effect of remittances shifts structurally or changes sign? (2) How does the marginal effect of remittances differ in countries below vs. above this threshold? (3) Do remittance effects transition from consumption to structural accumulation only after surpassing a financial threshold, as evidenced through savings behavior? (4) Does this regime-dependent pattern persist when poverty is measured using structural and social indicators such as access to electricity and child undernourishment?

By combining financial institutional theory, threshold modelling, short and long-run dynamics, this analysis offers both methodological innovation and policy-relevant insight on the evolving paradigm in the nonlinear effects of remittances-financial development, and its effects on poverty reduction.

2. Review of the Related Literature

The literature offers two main perspectives: (1) The substitution view argues that remittances act as informal substitutes for missing or malfunctioning credit markets and public services. In this logic, they provide a form of private insurance against state failure, especially in weak institutional contexts. Studies such as Adams and Page (2005) and Chami et al. (2005) show that remittances may buffer household consumption in countries with poor governance or underdeveloped financial systems, even in the absence of formal intermediaries. (2) The complementary view, by contrast, holds that remittances produce greater development benefits in the presence of institutional support and financial intermediation. Giuliano and Ruiz-Arranz (2009) and Aggarwal et al. (2011) find that the poverty- and growth-enhancing effects of remittances are magnified in countries with stronger financial systems. Here, remittances do not replace domestic institutions but work more effectively in tandem with them.

Building on the complementary analysis is the framework of absorptive capacity, which asserts that the developmental impact of any external input, whether foreign aid, technology, or remittances, depends on the receiving system's ability to internalize and deploy it productively (Cohen & Levinthal, 1990; Woolcock, 2001). In the remittance context, absorptive capacity is shaped by the depth, accessibility, and efficiency of domestic financial institutions. When financial institutions are sufficiently developed, remittances can be saved, invested, or channeled into long-term assets. In their absence, these funds tend to be used for short-term consumption, limiting their long-term poverty-reducing potential.

This conceptual framework is illustrated in Figure 2. At the core is a threshold mechanism, remittances flow into all countries, but their transformation into structural poverty reduction depends on whether the financial institutional system surpasses a minimum capacity level. Below this threshold, remittances act as consumption buffers but above it, they become development catalysts. Financial depth mediates this shift by enabling capital accumulation, financial inclusion, and productive intermediation. While social factors like financial literacy and trust remain relevant across contexts, they are especially binding in low-FID settings where formal intermediation is weak. In contrast, high-FID regimes activate institutional absorptive capacity, allowing remittances to translate into savings and long-term investment.

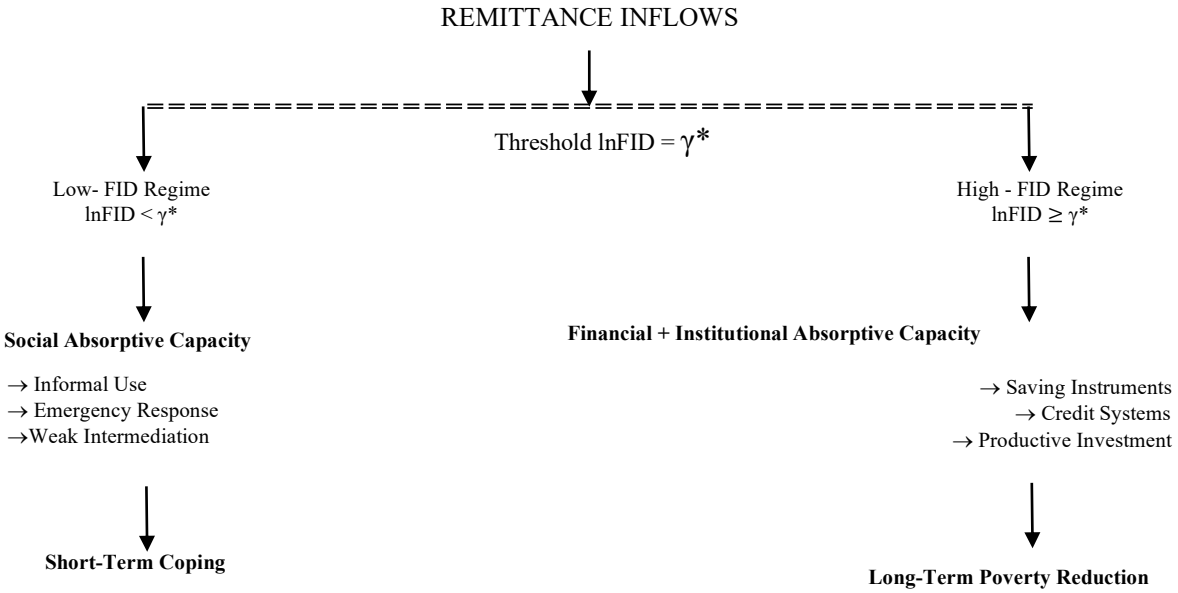

Figure 2. Conceptual Framework via Absorption Capacity Channels

Recent empirical studies have begun to explore this heterogeneity using nonlinear and threshold-based methods. Bangake and Eggoh (2020), using a panel of developing countries from 1985 to 2015, apply a Panel Threshold Regression (PTR) approach and find that the positive effect of remittances on economic growth only materializes when financial development, measured by private sector credit, surpasses a certain level. Ofori et al. (2022), focusing on Sub-Saharan Africa, estimate a threshold panel regression and show that remittance-induced increases in domestic investment occur only after financial development exceeds a critical threshold. While both studies demonstrate the conditional role of financial systems, their focus remains on growth and investment outcomes.

This study advances the literature by shifting the empirical lens toward poverty reduction, a more direct and urgent development objective. Unlike previous approaches that pool average effects across heterogeneous contexts, this paper identifies a specific institutional threshold above which remittances exert statistically significant poverty-reducing effects. Applying the dynamic panel threshold error correction framework by Seo and Shin (2016), the analysis provides formal evidence that remittances contribute to structural poverty alleviation only in high-financial-depth regimes. This offers a more realistic and policy-relevant understanding of remittance heterogeneity, one that is critical to achieving Sustainable Development Goals (SDG 1 on poverty, SDG 10.c on remittance cost, and SDG 8.10 on institutional development).

3. Methodology

This study uses unbalanced panel data from 96 developing countries (2002 to 2021) to assess whether remittances reduce poverty only beyond a threshold level of financial institutional development. The dependent variable is the log of the poverty headcount at $2.15/day (lnPOV).

The key independent variable is the log of remittances as a percent of GDP (lnREM) and the threshold variable is the log of domestic credit to the private sector by banks as percentage of GDP (lnFID). Control Variables including GDP per capita (lnGDP), trade openness (lnTRADE), control of corruption (CC) and foreign direct investment inflows (ihsFDI) are included to account for macroeconomic performance, structural conditions, and institutional

quality that may also influence poverty outcomes. All variables are taken from the World Development Indicator (WDI).

After verifying that all variables are integrated of order zero or one and cointegrated in the long run, the analysis applies the dynamic panel Threshold Error Correction Model (TECM) developed by Seo and Shin (2016). This method accommodates endogenous regressors, regime shifts, and both long- and short-run dynamics, making it ideal for remittance-finance-poverty interactions where a grid search is performed over the 10th to 90th percentile of lnFID to find the threshold (γ^*) that minimizes the sum of squared residuals. Equations (1) and (2) shows both the lower and upper models.

$$\Delta \ln POV_{it} = \theta^{L} \cdot X_{it} + \lambda^{L} \cdot ECM_{it-1} + \mu_i + \varepsilon_{it} \quad (1)$$

$$\Delta \ln POV_{it} = \theta^{H} \cdot X_{it} + \lambda^{H} \cdot ECM_{it-1} + \mu_i + \varepsilon_{it} \quad (2)$$

Here, X_{it} includes short-run differenced covariates such as D_lnREM and controls.

When the threshold is identified and statistically confirmed relevant through 1000 bootstrap replications, the study then proceeds estimates short-run TECMs separately for low-FID and high-FID regimes. The regime-specific model is specified in equation 3.

$$\Delta \ln POV_{it} = \alpha_i + \beta_1 \cdot \Delta \ln REM_{it} + \beta_2 \cdot \Delta \ln FID_{it} + \beta_3 \cdot (\Delta \ln REM_{it} \times \Delta \ln FID_{it}) + \beta_4 \cdot \Delta X_{it} + \lambda \cdot ECM_{it-1} + \varepsilon_{it} \quad (3)$$

where ECM_{it-1} is the lagged error correction term, and X_{it} includes control variables such as GDP per capita (lnGDP). The interaction term $\Delta \ln REM_{it} \times \Delta \ln FID_{it}$ tests whether the marginal effect of remittances depends on financial institutional depth. A negative and significant coefficient would support the absorptive capacity hypothesis.

To address potential endogeneity, a regime-specific instrumental variable (IV) strategy is implemented. Instead of pooled instruments like the Bartik, new IVs are constructed separately per regime. For the high-FID regime, the instrument is the interaction between oil rents and broad money supply in remittance-sending countries, reflecting liquidity-driven remittance capacity. For the low-FID regime, the instrument is the interaction between unemployment rates and CPI in origin countries, capturing labor market slack and inflationary pressure. These IVs are designed to affect remittance flows without directly influencing domestic poverty outcomes.

Two complementary diagnostics follow. First, Wald tests assess the joint significance of remittance-related terms within each regime. Second, to test for financial accumulation as a mechanism, remittance flows are regressed on gross savings (as % of GNI).

Finally, robustness checks will re-estimate the model using alternative poverty indicators, such as undernourishment prevalence(lnUNDER) and access to electricity(lnELEC), to test whether the conditional threshold effect holds across non-income dimensions of deprivation.

4. Empirical Results

This section presents the empirical evidence across four stages: (1) testing for long-run equilibrium, (2) identifying the financial threshold, (3) estimating regime-specific models, and (4) verifying mechanisms and robustness.

4.1. Cointegration Evidence

Before implementing the threshold model, the study conducted cointegration tests to verify the presence of a long-run equilibrium among remittances, poverty, and financial development.

Table 1. Panel Cointegration Test

Test	Statistic	p-value	Result
ADF (Fisher-type)	p= 29.43	0.043	Reject H_0 (5% level)
PP (Fisher-type)	p= 36.92	0.005	Reject H_0 (1% level)
Kao (DF t-statistic)	-2.686	0.004	Reject H_0 (1% level)
Westerlund (Error Correction)			
Pt	-12.943	0.000	Reject H_0 (1% level)
Gt	-2.924	0.100	Weak evidence
Pa	-8.168	0.090	Borderline
Ga	-5.335	1.000	Fail to reject H_0

Note: Null Hypothesis (H_0) is **no cointegration** in all tests.

The ADF, PP, and Kao test results in Table 1 mostly reject the null of no cointegration at conventional significance levels. The Westerlund test provides additional support, particularly through the error correction-based Pt and Pa statistics. These findings justify the use of the Threshold Error Correction Model (TECM) framework by Seo and Shin (2016), which captures both short-term adjustments and long-term relationships across financial regimes.

4.2. Financial Threshold Estimation (TECM)

2 presents the threshold estimation results using Seo and Shin (2016) TECM. The estimated threshold is lnFID = 3.00812, equivalent to approximately 20.26% of GDP in bank credit. A bootstrap likelihood ratio (LR) test with 1,000 replications confirms the statistical significance of the threshold at the 1% level. This value is used to define low-FID and high-FID regimes in the subsequent analysis.

Table 2. Threshold Identification Results

Specification	Value
Threshold search percentiles	10th to 90th
Total thresholds tested	300
Estimated threshold value (γ^*)	3.00812
Minimum Total SSR	446.39685
95% conf. interval	[0.2395, 39.9807]
Bootstrap replications	1000
Observed LR statistic	20.11
Empirical p-value	$p > 0.002$
Regime 1 sample size (lnFID $\leq$ 3.00812)	68; 16.45%
Regime 2 sample size (lnFID > 3.00812)	351; 83.55%

This value (lnFID = 3.00812), equivalent to roughly 20.26 % of GDP in domestic credit to private sector by banks marks the minimum financial capacity required to channel remittances toward productive ends. Continuing, the bootstrap likelihood ratio test confirms the presence of a statistically significant threshold in financial institutional depth, with an LR statistic of 20.11 ($p < 0.002$), strongly rejecting the null hypothesis of linearity.

The sample splits asymmetrically, with 83.55% of the observations falling above the threshold, while only 16.45% are below it. This reflects the reality that while most developing economies have crossed a basic financial depth threshold, a meaningful minority remain financially constrained.

4.3. Regime-Specific Results: Poverty Models across Financial Institutional Contexts

This section applies the observed threshold value by dividing the data into two regimes, Lower Regime (lnFID ≤ 3.00812) and Upper Regime (lnFID >3.00812), respectively. To enhance parsimony and interpretability, variables that were consistently insignificant across multiple specifications were removed. Even while doing so, coefficient magnitudes and statistical significance remained stable across nested models, confirming the robustness of the simplified specification.

In the low-FID regime, remittance inflows show no significant short-run impact on poverty. However, the ECM terms are highly negative and significant (-0.764 to -0.808), indicating rapid adjustment toward long-run equilibrium, consistent with consumption-driven responses to shocks. Remittances only become effective when combined with financial depth: the interaction term is negative and significant (-4.768 to -5.329), suggesting conditional impact. GDP growth remains a strong and consistent poverty-reducing factor (elasticities between -4.0 and -5.0).

Table 3. Two-Regime Specific Results Complete Results

	Lower Regime lnFID ≤ 3.00812			**Upper Regime lnFID >3.00812**		
Variable	FE	FE (w/ int)	FE-IV (w/ int)	FE	FE (w/ int)	FE IV (w/ int)
ECM_L1_pov	**-0.808*** (0.149)**	**-0.764*** (0.158)**	**-0.745*** (0.174)**	**-0.419*** (0.081)**	**-0.411*** (0.078)**	**-0.411*** (0.075)**
D_lnREM	-0.287 (0.394)	0.443 (0.384)	0.652 (0.769)	0.199 (0.358)	0.540 (0.373)	0.453 (0.650)
D_lnFID	0.598 (0.462)	**1.111** (0.416)**	**1.157*** (0.300)**	0.302 (0.458)	0.503 (0.575)	0.497 (0.528)
D_lnREM* D_lnFID		**-4.768*** (1.396)**	**-5.329*** (1.736)**		**-9.056*** (2.921)**	**-8.814*** (2.682)**
D_lnGDP	**-4.963*** (0.800)**	**-4.225*** (1.046)**	**-4.006*** (1.420)**	**-3.157** (1.500)**	**-2.970** (1.280)**	**-3.076*** (1.706)**
			Diagnostics			
R-squared	0.629	0.627	0.627	0.258	0.321	0.325

Note: Standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

In the high-FID regime, dynamics shift. The ECM is still negative and significant (-0.411) but slower, implying remittance effects are transmitted through longer-horizon channels like savings and investment. Direct remittance effects remain insignificant, but the interaction term becomes even stronger and highly significant (-8.814 to -9.056). This confirms that financial institutional maturity amplifies the poverty-reducing effect of remittances. GDP growth continues to matter, though with slightly smaller coefficients.

These results support the hypothesis that remittances are not inherently poverty-reducing but become effective under sufficient financial development. The stronger interaction effect in high-FID regimes underscores the absorptive role of financial systems. R-squared values are higher in low-FID models (~0.627), reflecting tighter consumption-driven effects, while lower R-squared in high-FID models (~0.258–0.325) suggests broader, more complex transmission mechanisms.

4.3.1. Functional Mechanisms and Joint Significance

The two complementary diagnostics test results below refine the interpretation of regime-specific remittance effects on poverty. The results clarify whether the remittance-poverty nexus reflects not just statistical breakpoints, but structural and behavioral inflection points. In the following subsections, two key diagnostics are presented: (1) joint significance of remittance terms by regime and (2) regime-based savings effects.

4.3.1.a Joint Significance of Remittance Terms of Financial Regime

Table 4 shows Wald tests for the joint significance of remittance terms across regimes. In the low-FID regime, remittance terms are jointly significant at the 5% level (F (2,13) = 3.96, p = 0.045), while in the high-FID regime, significance strengthens to the 1% level (F (2,28) = 7.62, p = 0.002).

Table 4. Wald Test for Joint Significance of Remittance Terms by Financial Regime

	Wald F-Statistic	**Degrees of Freedom**	**p-value**	**Conclusion**
Low-FID (lnFID < 3.00812)	F (2, 13) = 3.96	2, 13	0.045	5% level significance
High-FID (lnFID ≥ 3.00812)	F (2, 28) = 7.62	2, 28	0.002	1% level significance

Note: The Wald test jointly evaluates both linear and quadratic remittance terms (D_lnREM and D_lnREMsq), providing statistical confirmation that remittance effects are not only present but potentially nonlinear.

The stronger joint significance in high-FID regimes confirms that remittances carry greater explanatory power when financial institutional capacity is higher. This supports the hypothesis that financial institutions actively mediate remittance effectiveness rather than simply correlating with better outcomes.

4.3.1.b Remittances and Financial Accumulation: Evidence from Gross Savings

The regime-specific regressions using the HIS-transformed gross savings (% of GNI) ratio (ΔIHSGSGNI) in Table 5 indicate that remittances contribute significantly to financial accumulation only in high-FID regimes. In the upper regime, both D_lnREM (0.141) and D_lnREMsq (0.026) are positive and significant at 1%, suggesting a convex relationship. This implies that remittance-financed saving behavior is intensified as flows increase, but only under mature financial systems.

Table 5. Remittance Effects on Gross Savings by Financial Regime

D. Variable ΔIHS(GSGNI)	Lower Regime lnFID 3.00812	Upper Regime lnFID >3.00812
D_lnREM	0.070 (0.075)	0.141*** (0.047)
D_lnREMsq	0.012 (0.011)	0.026*** (0.010)
D_lnFID	-0.103 (0.132)	-0.584*** (0.248)
	DIAGNOSTICS	
Observations	619	1,049
Countries	62	76

Notes: Note: Standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Financial institutional depth (D_lnFID) is negative and significant at 1% (-0.584), indicating a possible shift in household financial behavior. In high-FID contexts, improved access to formal institutions may reduce reliance on precautionary savings. Alternatively, this pattern could reflect institutional saturation or macro-level dynamics not captured by gross savings metrics. One plausible interpretation is that households in financially mature environments diversify into illiquid or long-horizon investments outside the scope of national savings data. Regardless of the underlying mechanism, the strong remittance effects observed in this regime reaffirm the central role of financial institutional maturity in transforming the use of remittances.

By contrast, the lower regime exhibits no statistically significant relationship between remittances and savings accumulation, reinforcing the conclusion that financial institutional capacity is a necessary condition for channeling remittances toward productive financial uses.

4.4. Extended Indicators: Structural Poverty and Social Outcomes

To test whether the threshold effect extends beyond income poverty, this section applies the same estimation strategy to undernourishment (lnUNDER) and electricity access (lnELEC).

Table 6. Sensitivity Analysis Threshold and Regime Regression Results

Specification	lnUNDER	lnELEC
Estimated threshold (γ*)	3.59854	2.97620
Threshold search range	10th-90th percentile	10th-90th percentile
Grid points tested	300	300
Minimum SSR	11.766182	17.0187
LR test statistic	37.94	38.97
95% conf. interval	[16.732, 59.154]	[18.778, 59.163]
Bootstrap replications	1000	1000
Bootstrap p-value	0.000***	0.000**
Regime 1 sample size (≤ γ*)	1090	222
Regime 2 sample size (> γ*)	580	1692
Regime-Specific Effects		
Regime 1 (≤ γ*): ECM	-0.057*** (0.014)	-0.266*** (0.061)
Regime 2 (> γ*): ECM	-0.053 (0.032)	-0.149*** (0.017)
Regime 1 (≤ γ*): D_lnREM	0.002 (0.004)	0.010 (0.007)
Regime 2 (> γ*): D_lnREM	0.034* (0.018)	0.010(0.007)
Regime 1 (≤ γ*): D_lnREMsq	0.001 (0.001)	-0.001 (0.001
Regime 2 (> γ*): D_lnREMsq	0.005* (0.003)	0.001(0.001)
Regime 1 (≤ γ*): D_lnFID	-0.027**(0.010)	0.069***(0.017)
Regime 2 (> γ*): D_lnFID	-0.049(0.058)	0.040***(0.013)

Note: Standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 6 shows the results of the Robustness Checks (TECM and Regime-Specific Effects). Both indicators show statistically significant thresholds. Undernourishment yields a threshold at 36.5% of GDP (LR = 37.94, p<0.001), while electricity access shows a threshold at 19.6% of GDP (LR = 38.97, p<0.001). These values bracket the main poverty threshold of 20.26%, suggesting the financial institutional breakpoint is robust across welfare dimensions.

However, remittance effects differ markedly across indicators. For undernourishment, remittances show no significant effects in the lower regime and a counterintuitive positive coefficient (0.034) in the upper regime, suggesting that higher remittances are associated with more undernourishment. This likely reflects measurement issues or unobserved confounding rather than genuine remittance harm given that the level of significance is at 10%. For electricity access, remittances show no significant direct effects in either regime, though financial institutional depth remains significant in both. The weaker remittance effects for structural indicators compared to income poverty likely reflect different transmission mechanisms. Income effects can respond quickly to household transfers, while infrastructure and nutrition outcomes require longer-term, coordinated investments beyond individual remittance flows. The error-correction terms also show slower adjustment for structural indicators, consistent with their more complex determinants.

These results confirm that financial institutional thresholds exist across welfare dimensions but caution against assuming uniform remittance effectiveness. The threshold represents a necessary but not sufficient condition for remittance-driven development outcomes. Future research should explore why remittances affect different welfare dimensions through distinct channels and timeframes.

5. Synthesis

The preceding sections presented the empirical evidence for threshold effects in the remittance-poverty relationship. This chapter synthesizes those findings and draws broader implications for theory and policy.

5.1. Overall Synthesis

This study finds that remittances reduce poverty only when financial institutional depth exceeds a critical threshold, estimated at 20.26% of domestic credit to the private sector by banks (as a share of GDP). Below this point, remittances have no significant long-run effect on poverty and do not increase savings. Above the threshold, they correlate with capital accumulation, suggesting a shift from subsistence support to developmental use.

These effects hold across alternative models and welfare indicators. Remittances only gain statistical and functional traction in high-FID contexts, where institutional maturity enables longer-term planning and intermediation. Gross savings increase with remittances only above the threshold, reinforcing the importance of financial absorptive capacity. While this supports the theoretical framework, data limitations prevent exploration of other channels, such as social norms, governance, or trust, which may also shape remittance behavior.

These findings highlight a core insight: remittances do not reduce poverty unconditionally. Their developmental value depends not just on inflow volume or cost, but on the domestic systems that receive them. Financial institutional depth serves as the enabling constraint. Policies targeting remittance leverage must therefore integrate financial sector reforms, not just transfer facilitation.

5.2. Policy Recommendations

Policy recommendations differ based on a country's position relative to the identified threshold: (1) In Low-FID countries (lnFID < 3.00812) remittances remain consumption-oriented. Priorities include reducing transfer costs, expanding mobile delivery, improving access to formal accounts, and promoting financial literacy. Structural reforms in credit access and regulation are essential for long-term transformation. (2) In transition economies (lnFID ≈ 2.8-3.1), countries near the threshold, are positioned for high-return reforms. This group should scale remittance-linked savings products, microcredit channels, and digital finance infrastructure. Minute marginal improvements may unlock regime shifts. (3) High-FID countries (lnFID > 3.1), remittances already flow through formal systems. the list of countries and their regime category is available upon request. Policies should deepen access to investment instruments, promote remittance-backed financing, and protect institutional integrity. These settings benefit more from long-term planning than short-term inflow maximization.

Across all cases, the core message stands: the effectiveness of Remittance inflows is not solely a function of their size, but of the system they enter. It is this system, its depth, accessibility, and capacity, that will determine whether remittances alleviate poverty or merely sustain it.

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